REMARKS

Introduction

Status of claims

Claims 1 to 6 have been examined on the merits.

Claims 1 to 6 are pending.

Claims 1 and 4 have been amended.

Support for amended Claim 1 can be found at page 4, lines 1 to 8 where the composition of the composite is explained to be a C/SiC composite ceramic where carbon or graphite fibers are present in a matrix comprising predominantly silicon carbide and silicon.

Support for amended claim 4 can be found in page 3, lines 27 to 31 where the fiber diameter and length are disclosed.

No new matter has therefore been introduced, and entry of the amended claims is respectfully requested as this is deemed to put the application into better condition for allowance or appeal.

The Office Action

Rejection under 35 U. S. C. § 102(b)

Claims 1 to 6 have been rejected under 35 U. S. C. § 102 (b) as being anticipated by the Nixon reference "Non-Destructive Characterisation of SiC coated Carbon-Carbon Composites by Multiple Techniques" as published in the proceedings of the 24th International SAMPE Conference 1992.

This reference teaches the capability of "eddy current measurements ... to detect changes in the conductivity of carbon-carbon substrates which occur due to oxidation of both the fibers and the matrix". See page T16, first full paragraph, first sentence. While it is correct that in page T15, last paragraph, carbon-carbon composites are mentioned that have a coating of SiC, it should be pointed out that the SiC coating is made by the CVD technique (Chemical Vapour Deposition, see page T13, last paragraph, second and third sentences) which leads to a thin coating comprising merely SiC, and no fibers because there is no way to deposit carbon in the form of fibers when performing a CVD of SiC.

The carbon-carbon substrate of the Nixon reference itself is conductive (otherwise it would be impossible to detect changes in the conductivity if there were no conductivity at all to begin with), and general chemical knowledge teaches us that by oxidation of carbon, carbon monoxide or carbon dioxide are formed, both being gases consisting of covalently bound molecules, and as such are inherently non-conductive, therefore the conductivity could only decrease, and a decrease in conductivity starting from a non-conductive material is impossible. Furthermore, the correlation shown between the eddy current and the carbon loss in Figure 4 teaches that with increasing carbon loss (moving upwards in the graph of Figure 4), the eddy current is diminished (moving to the right in the graph of Figure 4), towards higher negative values of the change in percent in the eddy current. This would also be impossible if starting with a non-conductive body.

Therefore, the Nixon reference only teaches use of eddy current measurements to detect oxidation in **conductive substrates**. This is perfectly in accordance with the general knowledge which can be ascertained from the attached Wikipedia article which teaches, in the first paragraph of page 1, that a current is caused by the relative motion (or change) of a magnetic field intersecting a **conductor** (emphasis added).

When Nixon refers to variations in the substrate conductivity that are detected by the eddy current measurements, this variation being due to fiber type and volume, and matrix type, there is no suggestion that non-conductive, or semi-conductive material can be used.

As is also pointed out in claim 1, the absence of a skin effect is further proof of the fact that the substrate of claim 1, viz. the composite of the present application, is a non-conductor.

It is correct, as the Examiner takes Official Notice, that carbon fibers may be randomly dispersed in the carbon matrix, of a Carbon-Carbon Composite. However, as both the matrix and the fibers in the Nixon reference are conductive (both being carbon), it is obvious that the composite consisting of these components is also conductive.

In claim 1, however, it is particularly pointed out and explicitly claimed, that there are electrically conducting short fibers which are **isolated by the said non-conducting or semi-conducting matrix** (emphasis added). As the presence of isolated conductive fibers in a non-conducting or semi-conducting matrix does not lead to a conductive body (which would then show a skin effect, as is mandatory in a conducting body, see page 3 of the Wikipedia article), and as the Nixon reference does not describe carbon fibers

which are isolated by a non-conducting or semi-conducting matrix in a way that electrical conduction between these is restricted by the non-conducting or semi-conducting matrix the Nixon reference does not anticipate the subject matter of the present invention as it only discloses an eddy current test in conductive materials, i. e. carbon-carbon composite materials.

Rejection under 35 U. S. C. § 103 (a)

Claims 1 to 6 have also been rejected under 35 U.S.C. 103 (a) as being rendered obvious by the Nixon reference mentioned supra.

This reference discloses an eddy current test for carbon-carbon composite materials where a change of conductivity is measured due to oxidation. It should be emphasised that Nixon does not teach in general how to apply an eddy current test in any carbon fiber reinforced composites, but its teaching is limited to the carbon-carbon composite materials which have carbon fibers dispersed in a carbon matrix. As both fibers and matrix are conductive, the whole composite material is, of course, conductive.

A person skilled in the art would not have expected that an eddy current test would actually work in a composite which consists of conductive fibers which are dispersed in a non-conducting or semi-conducting matrix in a way that the composite remains non-conducting or semi-conducting, and therefore, does not exhibit a skin effect.

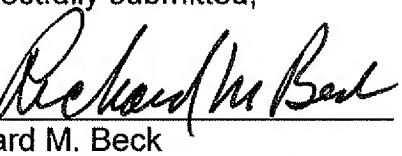
No way of randomly arranging carbon fibers in a carbon matrix of the Nixon reference could lead to a suppression of the skin effect which would be observed in all these cases, as the matrix itself, being carbon, would always be conductive, regardless of the arrangement of the carbon fibers therein.

It should also be emphasised that the SiC coating mentioned in the Nixon reference is not a composite, but a pure layer of silicon carbide which is deposited from the gas phase (and therefore, pure). Particularly, it is not a matrix material, as the presence of a matrix always calls for the presence of another phase dispersed therein. Therefore, there is no SiC matrix in the materials described in the Nixon reference.

Per amended claim 1, which is directed exclusively to a ceramic matrix which consists predominantly of SiC and Si, and which is mandatorily non-conductive or semi-conductive, a carbon matrix such as those enumerated in the Nixon reference, at page T16, first full paragraph, lines 6 and 7, is always conductive (as explained supra: a change in conductivity could not result from an increase, as the oxidation products of carbon are the cited gases, and non-conductive, therefore, by rules of logic, the material must be conductive before the oxidation sets in).

It is therefore deemed that the present invention as now particularly pointed out and distinctly claimed in amended claim 1 and the remaining dependent claims is neither anticipated nor rendered obvious by the cited art, and favorable reconsideration is respectfully requested.

Respectfully submitted,

By 

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